



Complete Summary

GUIDELINE TITLE

Angina pectoris and coronary artery disease (CAD).

BIBLIOGRAPHIC SOURCE(S)

Finnish Medical Society Duodecim. Angina pectoris and coronary artery disease (CAD). In: EBM Guidelines. Evidence-Based Medicine [CD-ROM]. Helsinki, Finland: Duodecim Medical Publications Ltd.; 2003 Oct 5 [Various]. [43 references]

COMPLETE SUMMARY CONTENT

SCOPE

METHODOLOGY - including Rating Scheme and Cost Analysis

RECOMMENDATIONS

EVIDENCE SUPPORTING THE RECOMMENDATIONS

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

IMPLEMENTATION OF THE GUIDELINE

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT

CATEGORIES

IDENTIFYING INFORMATION AND AVAILABILITY

SCOPE

DISEASE/CONDITION(S)

- Stable angina pectoris
- Coronary artery disease (CAD)

GUIDELINE CATEGORY

Diagnosis

Evaluation

Prevention

Risk Assessment

Treatment

CLINICAL SPECIALTY

Cardiology

Family Practice

Internal Medicine

INTENDED USERS

Health Care Providers
Physicians

GUIDELINE OBJECTIVE(S)

Evidence-Based Medicine Guidelines collects, summarizes, and updates the core clinical knowledge essential in general practice. The guidelines also describe the scientific evidence underlying the given recommendations.

TARGET POPULATION

Individuals with suspected or confirmed stable angina and coronary artery disease

INTERVENTIONS AND PRACTICES CONSIDERED

Diagnosis

1. Assessment of symptoms of angina pectoris
2. Physical investigations (blood pressure, heart rate, heart sounds, palpation, presence of pallor, signs of heart failure, other physical signs)
3. Electrocardiography
4. Laboratory investigations (serum lipids, blood glucose, blood haemoglobin, chest x-ray, myocardial enzymes or markers)
5. Exercise tolerance test
6. Radionuclide imaging (thallium scan) at rest or on exertion
7. Exercise echocardiography
8. Coronary angiography
9. Special diagnostic considerations in women

Assessment/Treatment of Risk Factors

1. Assessment of modifiable and non-modifiable risk factors
2. Drugs (acetylsalicylic acid [ASA], beta-blocker, statin) to slow down atherosclerosis and prevent myocardial infarction
3. Folic acid (and vitamins B6 & B12) to lower elevated homocysteine levels (a risk factor for accelerated atherogenesis)
4. Smoking cessation
5. Optimal treatment of hypertension
6. Reduction of hyperlipidaemia by using statins
7. Treatment of obesity, including recognition of metabolic syndrome and consideration of combination therapy with a statin and fibrate
8. Physical exercise
9. Hormone replacement therapy
10. Psychosocial interventions (e.g., stress management training)
11. Patient education

Treatment

1. Acetylsalicylic acid (aspirin)
2. Low-molecular-weight heparin
3. Coronary care unit monitoring

4. Sublingual "rapid" or aerosol nitrates (nitroglycerin)
5. Long-acting nitrates (nitroglycerin patch)
6. Beta-blockers, such as carvedilol
7. Angiotensin-converting enzyme (ACE) inhibitor in combination with beta-blocker
8. Dihydropyridine derivatives (amlodipine, felodipine, isradipine) in combination with beta-blockers
9. Calcium antagonists, such as diltiazem, nifedipine, lidoflazine, and verapamil
10. Revascularization (percutaneous transluminal coronary angioplasty [PTCA], coronary artery bypass grafting [CABG] surgery, off-pump coronary artery bypass [OP-CAB] grafting , coronary stenting, mini bypass)
11. Vitamin E, vitamin C, and beta-carotene
12. Dietary changes

MAJOR OUTCOMES CONSIDERED

- Sensitivity and specificity of diagnostic tests
- Risk reduction for cardiovascular events and death
- Mortality (total or overall)
- Coronary heart disease mortality
- Morbidity
- Reductions in blood pressure
- Reductions in smoking
- Reductions in blood lipids
- Improvements in exercise tolerance
- Improvements in psychosocial well-being
- Incidence of cardiac events
- Incidence of reinfarction
- Restenosis rate
- Arterial graft patency
- Adverse effects
- Cardiac death rate
- Number of angina episodes per week
- Dietary changes (reduction in calories as fat, urinary sodium)

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
 Hand-searches of Published Literature (Secondary Sources)
 Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The evidence reviewed was collected from the Cochrane database of systematic reviews and the database of abstracts of reviews of effectiveness (DARE). In addition, the Cochrane Library and medical journals were searched specifically for original publications.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Levels of Evidence

A: Strong research-based evidence. Multiple relevant, high-quality scientific studies with homogeneous results.

B: Moderate research-based evidence. At least one relevant, high-quality study or multiple adequate studies.

C: Limited research-based evidence. At least one adequate scientific study.

D: No research-based evidence. Expert panel evaluation of other information.

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not applicable

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not stated

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

The levels of evidence [A-D] supporting the recommendations are defined at the end of the "Major Recommendations" field.

Basic Rules

- A history, clinical examination, and some basic tests suffice for clinical diagnosis of stable angina pectoris in an elderly patient if revascularization is not being considered. Therapeutic trials often confirm the diagnosis.
- When the diagnosis is not clear, an exercise test is required for determining working capacity and often for insurance.
- When considering revascularization (Yusuf et al., 1994; DARE-920031, 1999; Sudlow et al., 2002; Davies, et al., 1997) [A], exercise test is usually the first examination.
- Serious or progressive (unstable) angina pectoris often requires urgent intervention in hospital without delay. Revascularization may be required.
- Prevention of coronary artery disease (CAD) includes effective reduction of the three "major" risk factors, in addition to estimation of the total burden of risk to the individual ("Coronary heart disease," 1996). Both pharmacological therapy and patient education (Mullen, Mains, & Velez, 1992; DARE-952495, 1999) [B] are effective.

Epidemiology

- CAD mortality of men under the age of 65 is three times that of women. In the older age group, the mortality of both genders is equal. After 80 years of age, the CAD mortality of women is twice that of men.
- Total CAD mortality remains unchanged but mortality under age 65 has fallen by 50% over the past two decades.

Clinical Manifestations of CAD

- Angina pectoris (AP) is the most common reason for seeing a doctor.
- Dyspnoea on exertion may present before pain and may be misinterpreted. Other manifestations of CAD are syncope on exercise, arrhythmias, silent ischaemia, unstable angina, acute or chronic heart failure, myocardial infarction, and sudden death.

Symptoms and Clinical Diagnosis of Stable AP

- For differential diagnosis of chest pain, see the National Guideline Clearinghouse (NGC) summary of the Finnish Medical Society Duodecim guideline [Differential Diagnosis of Chest Pain](#).
- Stable AP is a clinical diagnosis that means the precipitation of pain at a constant level of exercise characteristic for the patient. The pain is relieved after 10 minutes at rest and recurs without great daily variation in intensity. Variation is typical to nonischaemic chest pain.
- The pain, pressure, or ache of "typical angina pectoris"

- is precipitated by exertion
- is worsened if the exertion is continued
- is felt broadly in the middle of the chest (not in the cardiac apex)
- may radiate to the throat, shoulders, epigastrium, or back
- is worsened by the cold, after a heavy meal, or in static work
- is relieved in a few minutes by rest or nitroglycerin
- Only half of all patients have a typical presentation of the symptoms.
- The reliability of a history of AP is better in men. The probability of CAD in males over 55 with typical symptoms is 90%.
- Dyspnoea on exercise may be the earliest and the only symptom. Its cause is acute left ventricular (LV) failure leading to pulmonary congestion.
- Pain and dyspnoea force the patient to slow down or stop walking. Patients with non-ischaemic pain are able to continue.
- Nocturnal angina is, in most cases, a symptom of gastro-oesophageal reflux.
- Some patients describe AP pain as burning, which is why it may be misinterpreted as oesophageal pain.
- Ischaemic pain is usually predictable, precipitating at almost the same level of exertion. However, in some patients exercise tolerance may vary to some degree. Large variations are typical of non-ischaemic pain.
- The pain may be precipitated by psychological stress, as this causes a rise in pulse-pressure product.
- The pain may be triggered by rapid onset of walking. After "warming up" the patient can again "walk through his angina."
- The radiation of pain does not vary in the same patient.
- After hard exercise the pain may remain for 15 minutes. More prolonged pain should be suspected as myocardial infarction or delayed recovery from an ischaemic insult (stunning).
- Worsening of stable angina is termed unstable angina. It requires urgent treatment and usually hospitalization (Hansson et al., 1998).

"Atypical Pain" Not Suggesting Coronary Artery Disease

- appears also at rest
- exercise tolerance is good despite pain
- continues for hours or days
- is provoked by breathing or chest movements
- feels sharp or burning
- is localized lateral to cardiac apex
- may be reproduced by palpation at the thoracic wall
- is felt as palpitation or extrasystolia of a few seconds' duration
- is felt in the upper abdomen or below the left costal arch
- is not relieved with nitroglycerin after a few minutes

Investigations

Physical Investigation

- In most patients, physical signs reveal no pathology.
- Check blood pressure and heart rate, as pain often elevates both.
- Systolic bruit of a carotid or femoral artery suggests generalized atheromatous disease.

- Aortic murmur suggests aortic valve disease, which is frequently associated with CAD.
- S4 is common but silent and difficult to hear.
- S3 and a soft apical mitral murmur are signs of impaired cardiac function. They may also be a transient consequence of prolonged ischaemia.
- Palpation may reveal left ventricular hypertrophy (LVH). A patient with LVH is disposed to AP even when the CAD is mild.
- Pallor may suggest anaemia.
- Signs of heart failure may appear after prolonged ischaemia.

Electrocardiogram (ECG)

- The ECG is normal at rest in 30 to 50% of the patients. Recordings during an attack may be of value.
- Ischaemic ST-segment depression is sensitive but non-specific.
- Slightly prolonged (0.24 sec) PQ time is common in CAD.
- Patients with LVH often have ischaemia and AP (90%).
- Left bundle branch block (LBBB) suggests LVH and/or CAD.
- A previous infarction is a confident sign of CAD.
- Recording an ECG during an ischaemic attack is important. Reversible ST segment depression is strong evidence for CAD.
- Continuous monitoring in the coronary care unit (CCU) or by the Holter method may reveal silent ischaemia. This predicts CAD if the patient is at risk (Tresch, 1995; DARE-951202, 1999) [B].

Laboratory Investigations

- Serum lipids, blood glucose and blood haemoglobin
- Chest x-ray: heart failure, valvular calcification, and other causes of chest pain
- Even a slight rise in myocardial enzymes or markers after a prolonged angina attack is often serious and signifies risk of infarction. Further examinations are necessary (see the NGC summary of the Finnish Medical Society Duodecim guideline [Unstable Angina Pectoris](#)).

Exercise Tolerance Test

- AP is a clinical diagnosis that can be confirmed either by ECG during a spontaneous attack or by a therapeutic trial of nitroglycerin. Exercise test is not a routine examination.
- Exercise test has many limitations and problems of interpretation. The sensitivity and specificity are about 60 to 80%.
- The patient at risk, with a typical history of AP, ischaemic pain on a tolerance test, and a simultaneous ischaemic ST segment, has a very high probability of CAD.
- An ischaemic ST (over 2 mm) even without angina (silent ischaemia) predicts CAD, especially if the patient is at risk. Silent ischaemia is most often revealed during coronary care unit or Holter monitoring. Its significance is being debated and depends on the severity of CAD and the risk factors.
- Difficulties in the interpretation of an exercise test are met particularly with patients who have a low pre-test likelihood of CAD. A false-positive test result

is most often obtained from sympathicotonic women under 50 years with atypical angina and without risk factors.

- A syndrome-X patient has typical AP and an abnormal exercise test result but normal coronary angiography and a benign prognosis. The syndrome is much more common among women under 50 years.
- A normal test result does not exclude CAD; however, the probability of moderate to serious CAD is very low.
- The patient should remain untreated until a diagnosis is made, with the exception of acetylsalicylic acid (ASA) administration. An exercise test gives valuable information about the severity of the diagnosed disease and the need for further investigations. After determining the severity of the disease, the patient must be treated optimally.

Radionuclide Imaging (Thallium Scan) at Rest or on Exertion

- The sensitivity is somewhat higher; the specificity is equal to that of the exercise test.
- Valuable when the ECG is non-diagnostic because of concurrent abnormalities (left bundle branch block, LVH, Wolff-Parkinson-White syndrome [WPW]).

Exercise Echocardiography

- Detects wall motion abnormalities, especially in the left main vessel disease
- Optimal sensitivity up to 90%
- Important when ECG is non-diagnostic because of abnormalities

Coronary Angiography

- Details in the EBM guideline Coronary Angiography and Indications for Coronary Artery Bypass Graft (CABG) or Angioplasty (See the related NGC summary of the Finnish Medical Society Duodecim guideline [Coronary Angiography and Indications for CABG or Angioplasty](#))
- Mainly an investigation preceding invasive therapy. Nowadays used increasingly for diagnosis.

Special Diagnostic Problems in Women

- The specificity of "typical angina" symptoms is lower (about 50%) in premenopausal women.
 - Only about half of the women with typical AP have a significant ischaemic heart disease.
 - Under the age of 50, women experience chest pain more often than men. The pain is usually "atypical."
 - At an older age, the diagnostic sensitivity of the symptoms becomes as good as that in males (90%).
- The predictive value of exercise test is poorer in women because of a sympathicotonic ST change. The number of false-positive test results is high before menopause.
- An ischaemic ST change and yet a normal angiography finding (syndrome-X) are much more common in premenopausal women compared with men.
- Under the age of 50, the specificity of radionuclide imaging and exercise echocardiography is higher than that of the traditional exercise test.

Treatment of Risk Factors

- It is difficult to obtain firm evidence on the benefits of treating a single risk factor. The conclusions are based on epidemiological observations and pathophysiology.
- Minimizing all risk factors to slow down atherosclerosis and prevent myocardial infarction (MI) is considered important. Efficient secondary intervention usually includes ASA, beta-blocker, statin, and discontinuation of smoking (Ebrahim & Smith 2001; Ebrahim & Smith, 1997; DARE-978187, 1999; "Coronary heart disease," 1996) [D].
- Smoking should be discontinued and alcohol consumption should be limited to moderate amounts.
- Hypertension should be treated optimally. The target level of below 140/90 mmHg should be reached. According to the recent Hypertension Optimal Treatment (HOT) study (Hansson et al., 1998) the optimum is 138/83 for CAD patients. Further lowering of diastolic pressure is neither more beneficial (except in diabetics) nor harmful. According to the present view, lowering diastolic pressure to below 90 mmHg does not increase the risk of infarction.
- Effective reduction of hyperlipidaemia is often possible only by using statins. Target levels:
 - Total cholesterol level below 5.0 mmol/L
 - Low-density lipoprotein (LDL) value below 3.0 (-2.5) mmol/L. Drug therapy is indicated if LDL does not decrease to below 3.0 with drugless therapy.
 - Serum triglyceride level below 2 mmol/L
 - Serum cholesterol/serum high-density lipoprotein (HDL) below 5. Serum HDL in men >0.9 and in women >1.1
 - See the related NGC summary of the Finnish Medical Society Duodecim guideline on [Drug Treatment for Hyperlipidaemias](#) for details on drug therapy.
- Treating obesity
 - Weight must be reduced to a target of body mass index (BMI) 28.
 - Recognize metabolic syndrome and consider starting combination therapy with a statin and fibrate
- Physical exercise
 - Regular exercise improves the sense of well being and prognosis by reducing many risk factors (U.S. Department of Health and Human Services [DHHS], 1995; DARE-968500, 1999; Kugler, Seelbach, & Kruskemper, 1994; DARE-955057, 1999) [A]. Physical activity is also significant in primary prevention (Murphy et al., 2002) [C].
 - Intense physical strain should be avoided.
- On the basis of epidemiological studies, hormone replacement therapy (HRT) has been considered beneficial for women with risk factors. A randomized secondary prevention study (Heart and Estrogen/Progestin Replacement Study [HERS]) did not, however, show any benefit from hormone replacement therapy (Hulley et al., 1998) [B].
- Elevated serum homocysteine concentration is associated with vascular diseases; however, it does not appear to predict arterial disease in healthy individuals (Knekt et al., 2001) [C]. Homocysteine concentration correlates positively with blood pressure, cholesterol concentration and smoking and is thus an indicator of the severity of the atherosclerotic process. Folic acid (and vitamins B6 and B12) lower serum homocysteine concentration, but evidence on its effect in slowing the progression of vascular disease is scant (only one

- study in which the administration of vitamins after percutaneous transluminal coronary angioplasty [PTCA] lowered the incidence of restenosis) (Schnyder, et al., 2002) [B]. Several studies on secondary prevention are ongoing.
- Too hard physical or psychological stress may be dangerous. Psychosocial interventions (e.g., stress management training) are beneficial (Linden, Stossel, & Maurice, 1996; DARE-968404, 1999) [A].
 - Age, male gender, and family history of coronary heart disease (CHD) are non-modifiable risk factors. They must be included in assessment of the total burden of risk factors.

Methods of Action and Treatment Targets of Pharmacotherapy

- Ischaemia is reduced by optimisation of blood pressure and heart rate. Beta-blockage is sufficient when heart rate is 60 to 50 bpm. The treatment of hypertension aims at an optimal pressure, which according to the HOT study (Hansson et al., 1998) is 148/83 mmHg.
- ASA is not a symptom drug. It reduces the blocking of coronary arteries. ASA is recommended for all patients with ischaemic heart disease, unless contraindicated.
- Unstable angina (pre-infarction angina) must be treated urgently with ASA and/or clopidogrel, and revascularization should be planned.

Choosing the Drug

- Sublingual "rapid" or aerosol nitrates that are classically used for acute episodes should also be used for prophylaxis.
- A selective beta-blocker reduces both heart rate and blood pressure. The target heart rate is about 60 bpm at rest and below 120 bpm during exercise. With age the dose can usually be reduced. Beta-blockers are first-line drugs also for the arrhythmias of ischaemic heart disease (IHD) patients. Heart failure is not a contraindication. Carvedilol may be the best choice in these cases. In heart failure an angiotensin-converting enzyme (ACE) inhibitor is usually combined with beta-blocker. Beta-blockers are not only a symptomatic therapy, but they also reduce the risk of cardiac infarctions and sudden deaths by 10 to 30%.
- Calcium antagonists may be used in case of adverse effects caused by beta-blockers. The most often used classic beta-blocker is diltiazem. Angina after a non-Q-wave infarction has been considered a special indication. New dihydropyridine derivatives (amlodipine, felodipine, isradipine, nisoldipine) can be combined with beta-blockers in the treatment of stable AP particularly if hypertension is associated. The effect of calcium antagonists on prognosis is not documented as well as that of beta-blockers.
- Long-acting nitrates can be combined with a beta-blocker when the latter is not sufficient alone, or used instead of beta-blocker when the drug is not tolerated. Nitrate is administered when symptoms occur, which is often daytime. The usual dose is 20 to 40 (-60) mg/day. A nitrate patch can be used to treat nocturnal angina. The patch should be removed in the morning to avoid nitrate tolerance. For the same reason a pause should be kept in the administration of long-acting nitrates (for example, in the evening or at night). Nitrates are a symptomatic therapy and are not needed if the patient has no symptoms. They improve exercise tolerance but probably not the prognosis.

- The combination of beta-blockers, calcium antagonists, and long-acting nitrates (triple therapy) is usually more harmful than beneficial.

Revascularization

- See: The Database of Abstracts of Reviews of Effectiveness (University of York), Database no.: DARE-951202. In: The Cochrane Library, Issue 4, 1999. Oxford: Update Software.
- Coronary angiography is called for if the patient, while on the proper medication, has disturbing ischaemic chest pains, and myocardial ischaemia has been verified (e.g., by exercise tolerance test). The method of revascularization is defined by the coronary anatomy found in the coronary angiography and the location and number of stenoses (DARE-978340, 2000).
- Coronary artery bypass grafting (CABG) (Sim, et al., 1995; DARE-953385, 1999)
 - Stenosis of the left main coronary artery (LCA) or the respective three-vessel disease are established indications for surgery (Ebrahim & Smith, 2001; Newell, Bowman, & Cockburn, 1999).
 - Coronary artery bypass grafting is often a better option if the patient has several occlusions or the coronary anatomy is unfavourable to PTCA, or, if the patient has diabetes or uraemia, if the function of the left ventricle is considerably lowered or the patient has significant valvular disease (Ebrahim & Smith, 1997).
- Minimally invasive off-pump coronary artery bypass (OP-CAB) grafting (Mack, Osborne, & Shennib, 1998; DARE-981734, 2000) [C]. Off-pump bypass grafting is a new surgical method that does not require the use of the heart-lung machine and thoracotomy.
- PTCA
 - 1 to 2 vessel CAD is an established indication for PTCA (Newell, Bowman & Cockburn, 1999).
 - If the operative risks are high (e.g., difficult pulmonary disease, age) PTCA can be performed also in left main coronary artery stenoses and in three-vessel disease.
 - A patient that has coronary stenosis and earlier has gone through a bypass operation is primarily treated with PTCA.
 - Fitting of a stent is an important part of PTCA. Approximately 80% of patients are fitted with stents. This has greatly diminished the number of complications and risk of restenoses. In selected cases the stent is impregnated with muscle growth inhibitor. The preliminary results are promising, and the use of medicated stents will extend the indications for PTCA.
 - Acute myocardial infarction: a large infarction that does not respond to thrombolysis (rescue angioplasty) or the patient has a contraindication to thrombolysis and is at risk of a massive anterior infarction. Primary angioplasty is increasingly replacing thrombolysis (Cucherat, Bonnefoy, & Tremeau, 2002; Sim, et al., 1995; DARE-953385, 1999; Grines, et al., 1999) [A], which is clearly not as efficient as angioplasty in achieving patency of the vessels. Long-term outcomes also favour angioplasty, largely due to stenting (The Wessex Institute for Health Research and Development, 1998; DARE-989742, 2000; "Coronary artery stents," 1998; DARE-999268, 2001) [B] (DARE-

978187, 1999; U.S. Department of Health and Human Services, 1995).

Related Evidence

- Epidemiological studies suggest a reduction of cardiovascular risk associated with increased intake of vitamin E, but randomized controlled trials remain inconclusive (Lonn & Yusuf, 1997; DARE-971422, 1999; Rihal, 2002) [C]. Beta-carotene has not been shown beneficial in randomized trials, and it may be associated with increased risk of cancer. (Rihal, 2002) [C]. Hyperhomocysteinaemia is an indicator of accelerated atherogenesis. It may be easily lowered with folic acid and other B group vitamins, but the risk still remains (Welch & Loscalzo, 1998).
- Vitamin E supplementation has no effect on cardiovascular outcomes in high-risk patients (Yusuf, et al., 2000) [A].
- In patients with coronary disease, the use of short-acting nifedipine at moderate to high doses may cause an increase in total mortality (Furberg, Psaty, & Meyer, 1995; DARE-952548, 1999; Stason et al., 1999; DARE-990332, 2000) [C].
- Beta-blockers and calcium antagonists (verapamil and diltiazem) provide similar outcomes, but beta-blockers may have fewer adverse effects (Heidenreich, et al., 1999; DARE-999257, 2000) [B].
- Dietary advice from health personnel is effective in achieving modest dietary change and cardiovascular risk reduction (Brunner, et al., 1997; DARE-978340, 2000) [B].
- Compliance in the treatment of cardiovascular disease can be increased with several strategies. However, the quality of studies is suboptimal and no firm recommendations can be made of different strategies (Newell, Bowman, & Cockburn, 1999; DARE- 20008010, 2002) [B].
- There is some weak evidence that fish consumption may reduce the risk of coronary death in high-risk populations, but probably not in low-risk populations (Marckmann & Gronbaek, 1999; DARE-991629, 2001) [C].
- Low cardiorespiratory fitness is a strong and independent predictor of CAD and all-cause mortality and is comparable in importance with that of diabetes mellitus and other CAD risk factors (Wei, et al., 1999) [C].
- Treating depression after myocardial infarction does not improve prognosis (Berkman et al., 2003) [B].

Definitions:

Levels of Evidence

A: Strong research-based evidence. Multiple relevant, high-quality scientific studies with homogeneous results.

B: Moderate research-based evidence. At least one relevant, high-quality study or multiple adequate studies.

C: Limited research-based evidence. At least one adequate scientific study.

D: No research-based evidence. Expert panel evaluation of other information.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

[References open in a new window](#)

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

Concise summaries of scientific evidence attached to the individual guidelines are the unique feature of the Evidence-Based Medicine Guidelines. The evidence summaries allow the clinician to judge how well-founded the treatment recommendations are. The type of supporting evidence is identified and graded for select recommendations (see the "Major Recommendations" field).

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

- Appropriate diagnosis and treatment of angina pectoris and coronary artery disease
- Decreased morbidity and mortality associated with angina pectoris and coronary artery disease
- Cardiovascular risk reduction

POTENTIAL HARMS

Adverse Effects of Medications

- Nitroglycerine lowers systolic blood pressure and may cause syncope; nitroglycerine can also cause severe headache.
- Beta-blockers and calcium antagonists can cause adverse effects.

Exercise Tests

Exercise test has many limitations and problems of interpretation. The sensitivity and specificity are about 60 to 80%.

Subgroups of Patients Most Likely to Experience Harms Associated with Exercise Tests

- Difficulties in the interpretation of an exercise test are met particularly with patients who have a low pre-test likelihood of coronary artery disease.
- A false-positive exercise tolerance test result is most often obtained from sympathicotonic women under 50 years with atypical angina and without risk factors. The predictive value of exercise test is poorer in women because of a

sympathicotonic ST change. The number of false-positive test results is high before menopause.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness
Staying Healthy

IOM DOMAIN

Effectiveness
Patient-centeredness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Finnish Medical Society Duodecim. Angina pectoris and coronary artery disease (CAD). In: EBM Guidelines. Evidence-Based Medicine [CD-ROM]. Helsinki, Finland: Duodecim Medical Publications Ltd.; 2003 Oct 5 [Various]. [43 references]

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2001 April 30 (revised 2003 Oct 5)

GUIDELINE DEVELOPER(S)

Finnish Medical Society Duodecim - Professional Association

SOURCE(S) OF FUNDING

Finnish Medical Society Duodecim

GUIDELINE COMMITTEE

Editorial Team of EBM Guidelines

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Primary Authors: Editors

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Finnish Medical Society Duodecim. Angina pectoris and coronary artery disease (CAD). Helsinki, Finland: Duodecim Medical Publications Ltd.; 2001 Dec 30. Various p.

GUIDELINE AVAILABILITY

This guideline is included in a CD-ROM titled "EBM Guidelines. Evidence-Based Medicine" available from Duodecim Medical Publications, Ltd, PO Box 713, 00101 Helsinki, Finland; e-mail: info@ebm-guidelines.com; Web site: www.ebm-guidelines.com.

AVAILABILITY OF COMPANION DOCUMENTS

- EBM guidelines. Evidence-based medicine. Helsinki, Finland: Duodecim Medical Publications, Ltd. 2002. [CD-ROM]
- EBM guidelines. Web site: www.ebm-guidelines.com.

Available from: Duodecim Medical Publications, Ltd, PO Box 713, 00101 Helsinki, Finland; e-mail: info@ebm-guidelines.com; Web site: www.ebm-guidelines.com.

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on August 28, 2001. The information was verified by the guideline developer as of October 26, 2001. This summary was updated by ECRI on December 9, 2002 and December 29, 2003.

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The logo for FIRSTGOV, featuring the word "FIRST" in blue and "GOV" in red, with a small red star above the "I".

